

Measure Information: Lighting Controls

Submitted By: Harold Jepsen, P.E.

RE: Automatic Controls to Shed Lighting

Description

In non-residential buildings over 25,000 square feet, require the ability to automatically shed 50% of the general lighting to limit peak load energy use. This could be done automatically through an automatic time switch control device, building automation system, or signal from a power alert center.

Benefits

Providing the controls to shed lighting in larger non-residential buildings, provides the ability to reduce peak load demand in periods of energy alerts and high energy demand.

Environmental Impact

No known significant environmental impact other than the manufacturing, shipping and installation impact of the lighting controls devices.

Type of Change

This change would be a mandatory measure and would require changes to the standards section 131. It would also require changes to the compliance manual.

Suggested Standard Language:

SECTION 131

Controls to Shed Lighting

1. Buildings 25,000 square feet or larger shall have the automatic ability to shed 50% of the general lighting in a building by either an automatic time switch control device or automatic signal from an energy alert center by:
 - A. Utilizing controls to reduce lighting in section 131 (b); and
 - B. Prevent occupants from overriding lights on that have been automatically shed; and
 - C. On termination of the automatic shed signal, the system shall restore the lighting to the proper operational state and allow occupants to control the lighting.

Measure Availability and Cost

Shed controls can be implemented by a number of methods using readily available lighting control systems, building automation systems and automatic times switch control devices. The cost of measure compliance will vary depending on the type of lighting controls being used in a facility. If a comprehensive lighting control system is being used to control all the lighting in the building already, the system can usually be programmed to accept load shed signals. The cost here is the extra programming, set-up and commissioning.

Building automation systems (BAS) can be programmed to provide the same function given the BAS is tied into controlling the lighting controls where it can command reduced level lighting. If it cannot control the lighting at this level, costs would be added so the BAS can control down to the discrete reduced level

of lighting to allow load shed to operate properly. This cost could range from providing programming changes to requiring additional equipment such as contactors, relays and BAS I/O modules.

Intelligent distributed control systems may also provide the ability to load shed bi-level lighting. Intelligent power packs that work in conjunction with the occupancy sensors and switches, control the bi-level lighting in a building. A shed signal communicates to the intelligent power packs and causes the lighting level to reduce automatically. These power packs add a materials cost of \$50 to \$150 dollars to each individual control point over the cost of a system using occupancy sensors and standard power packs.

All of these systems are available from multiple vendors through standard industry channels of distribution.

Useful Life, Persistence and Maintenance

All considerations for useful life, persistence and maintenance are the same as under the present lighting control standards. Implementing this measure would require using the same lighting control equipment as presently used to satisfy other lighting control requirements.

Any system with an automatic time switch control device occasionally requires maintenance to change schedules with the changing time schedules and seasons of a facility's operating hours. This would be the same if using a time switch to schedule lighting shed during peak demand periods.

Performance Verification

The installation, calibration and commissioning of all controls should be done according to the manufacturer's instructions and recommendations. Commissioning documentation should be required in the contract documents and approved by a representative for the building owner. Accurate installation, calibration and commissioning is key to good performance of lighting control equipment.

Cost Effectiveness

The cost effectiveness of this measure is not presently known. This measure's purpose is not about saving energy, although it can, it is about shedding peak load. It can also play a part in a market of time of use rates.

Analysis Tools

None cited.

Relationship to Other Measures

None cited.

Bibliography and Other Research

None cited.